

stating that the dark spot seen was, if anything, darkest towards its centre, and estimating its magnitude as somewhat less than that of the satellite when seen on a dark ground.

With the above facts my own observations seen to be in perfect accordance. I trust I shall not be considered presumptuous in having made the above statement, as the telescopes made use of in examining the forms of the disks of the satellites invariably show two of them, namely, the second and third, with truly round sharp outlines, free from the slightest trace of scattered light if the air be favourable, under powers of 500 diameters and upwards.

On a review of the whole of the facts in my possession, I incline to an impression that they may be plausibly explained by two assumptions—(1) That the fourth satellite's periods of orbital and axial rotation are identical; (2) That an extensive dusky shading exists on that hemisphere which is turned towards us at the time of inferior conjunction, variable in area and probably also in intensity.

May 22, 1873.

Note on Jupiter, 1873. By E. B. Knobel, Esq.

No account of the physical aspect of *Jupiter* in 1873 having, as far as I am aware, been presented to the Society, I am induced to submit the accompanying three sketches made under favourable circumstances, and which I think are not without interest.

The most striking feature is the great change in the equatorial zone; the port-hole markings, which were conspicuous at the previous opposition, have disappeared, and long, irregular, broken masses, horizontal and inclined at a considerable angle to the equator, have taken their place. The north temperate dark belt, which has been previously depicted as single, is really a double belt, as in the drawings. On April 20th, and May 11th, the south tropical dark belt * appeared thinned out towards the east. The south temperate dark belt has appeared of irregular width, widening towards the west, as in sketch No. 3.

Atmospheric influences this year have been fatal to observations of colour; but on May 11th, definition being remarkably good, the south tropical dark belt was observed of a brick-red tint, more decidedly red than the darker parts of the equatorial zone.

In sketch No. 1, the fourth satellite is represented in transit. An observation of this transit by Mr. Roberts appears in the *Monthly Notices* for April, and therein particulars of the emersion are requested. Having observed the transit and emersion very closely with my $8\frac{1}{2}$ -inch reflector, I can only say, in reply to

* The south tropical dark belt is really part of the equatorial zone, but I have given it a distinctive name in consequence of its thinning out, and therefore appearing like a separate belt altogether.

Mr. Roberts, that I did not notice the appearance in the satellite he describes. It appeared black, but not so decidedly black as a shadow; it performed the transit, half of it seen on a bright mass, half on a dark portion of the equatorial zone, as in sketch No. 1. On emersion, I have noted "the satellite appeared as a disk, the one-half on the planet forming a notch in the limb, the other half clear of the planet, just discernible; when quite clear of the limb, the satellite shone with a faint dusky light." I did not test its visibility with a less aperture.

Burton on Trent, June 9th, 1873.

Note on the Disappearance of the Coloured Equatorial Belt of Jupiter. By John Browning, Esq.

The colour of the equatorial belt of *Jupiter* was fading during the last weeks of the previous opposition; during the present opposition the colour has been scarcely, if at all, perceptible; there is a conspicuous absence of any intense markings on the surface of the planet, the copper-coloured belts being fainter than usual. Great changes have taken place in the fainter markings, and some of these with great rapidity. On several occasions the belts have appeared inclined at a considerable angle to the equator. During the whole of the opposition the definition has been so uniformly bad that I have found it useless to make drawings of the planet.

Note on the Mass of Jupiter. By W. T. Lynn, B.A.

In *Monthly Notices*, vol. xxvii. No. 1, for November, 1866, I had the honour to lay before the Society an account of a determination of the mass of *Jupiter* as deduced by Professor Krüger from the observations of *Themis*, a planet which, from the position which it sometimes occupies with respect to *Jupiter*, offers peculiar advantages for the purpose in question. He has now availed himself of the fresh material afforded by subsequent observations, and also succeeded in removing an uncertainty to which one of his former normal places was exposed; and the result has been communicated to the *Astronomische Nachrichten* (No. 1941).

It gives for the mass of *Jupiter*, compared with the Sun $\frac{1}{1047.538}$, and it will be of interest to compare this with other values of the same quantity determined by different methods. Airy's last-determined value from the motions of the satellites was $\frac{1}{1046.77}$; Bessel's in the same manner $\frac{1}{1047.879}$; Captain Jacobs', also from observations of the satellites made by himself at Madras in